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Mr. Eugene A. Miller
Environmental Services Manager
Environmental Services Department
Lord Corporation
4917 Pittsburgh Avenue
Erie, PA 16509

February 15, 1994

RE: Lord Shope Landfill Superfund Site
Pre-Final Remedial Design Review

Dear Mr. Miller:

The U.S. Environmental Protection Agency (EPA) has completed its review of the Pre-Final Remedial Design submission, for the Lord Shope Landfill Site (Site). Specific comments on the submittal are enclosed.

A meeting or conference call would be helpful to discuss comments and related issues and any necessary revisions prior to the preparation of the Final Design Submission. Comments on the Pre-Final Design Submission Volume IV: Attachment C: Wetlands Assessment Report, will be sent during the week of February 21, 1994.

If you have any questions, please do not hesitate to contact me at 215-597-3218.

Sincerely,

David P. Turner, RPM
Environmental Engineer

1 Encl

cc: [redacted]
R. Kimball, PADER
[redacted], Eckenfelder
R. Burr, FWS

Pre-Final Design Submission
Volume I. Engineering Report: (Comments 1 through 16 below)

1. Page 3-2, Paragraph 3

The diffusion constant evaluated from the slug test should be referred to as time constant.

2. Page 3-2, Paragraph 4

Confirm that the increase in iron concentrations with the increase in distance from the landfill has been incorporated into the treatment system design.

3. Page 3-7, Paragraph 3

Mention that limits of aluminum etc. were never exceeded however, **Page 3-5, Para 2,** mention that Aluminum *exceeded* the proposed monthly average limit on one occasion.

4. Page 4-3, Paragraph 3

Monitoring the internal landfill conditions to remain a safe level below the LEL might help in reducing the risk of explosion.

5. Page 4-6, Paragraph 2

What is the basis of identifying dead-spots in the landfill? Can the temperature probes function as passive vents as well as temperature probes?

6. Page 4-8, Paragraph 5

In a research article by the David B. Urban "Groundwater Contamination Affects Soil Vapor Extraction" published in the *Industrial Wastewater* (August/September 1993) magazine, the authors have evaluated an existing and operating ISVS systems. The ISVS system which was estimated to remove a total of 8 kilograms of organics actually removed 327 kilograms of organics during the operation period. The apparent continuous source of organics has been hypothesized to be contaminated groundwater at the site. This study may have implications for the Lord-Shope remediation, where the contaminated groundwater/landfill material can behave as a continuous source of organics and jeopardize the operation of the ISVS system.

7. Page 4-10, Paragraph 9

"Collected condensate at the condensate tank and demister will be pumped to the groundwater treatment system". Does the groundwater treatment system design take into account the increased organic loading from this source?

8. Page 4-5, Paragraph 4

If there is a decrease in the concentration and total mass flow of organic species with an increase in the extraction flow rates (see Table 4-3), what is the justification of extracting at high flow rates (e.g., 90 cfm) given that the risk of landfill fire will increase with high extraction flow rates? A better explanation of how extraction rates were calculated from pilot test data are needed.

9. Page 4-12, Paragraph 1

Document how the estimated concentrations were calculated (a reference to another Design document may be appropriate). Also, a typo is present: "mass emission rates we listed in" should read "mass emission rates are listed in".

10. Page 4-20; First Paragraph:

Please state that soil borings not selected for extraction well development will be grouted to the surface.

11. Page 4-21, Paragraph 2

The reference, Thornwaite and Mather (1957) needs adequate citing.

12. Page 4-31, Paragraph 2 (also applies to Section 11230 of Specifications and Air Stripper Calculations in Appendix D)

The Henry's constant for vinyl chloride was calculated using 25°C as the temperature. It is unclear whether the EPA model adjusts the constant for temperature. The design groundwater temperature is 12°C, at which the Henry's Constant may be up to an order of magnitude lower. Confirm that Henry's constant was converted 12° C or resize the column to account for lower volatility at lower temperatures.

13. Page 4-34; Fifth Paragraph:

This paragraph states that: "perimeter curbing is being considered to provide spill containment for the entire

building, in lieu of individual curbs at the treatment equipment." However, the last paragraph of **Section 4.4.3** states that: "containment curbing will be installed around the entire building and is designed to contain 100 percent of the capacity of the largest water containing equipment." Clarify this paragraph and state if the perimeter curb will be inside or outside the building.

14. Appendix D; Thermal Expansion/Contraction Calculations:

Recalculate the spacing of the thermal expansion and contraction joint equations. The average low for the winter months (December, January, February) is incorrect.

The calculations presented used the average high for the winter months instead of the average low. This needs to be corrected.

15. Appendix G; Page G-3; First Paragraph:

The first paragraph is incomplete, this needs to be corrected.

16. Appendix G; Page G-4; First Sentence:

Delete the first sentence on page G-4. this language is present in the last sentence on page G-3.

Pre-Final Design Submission
Volume VII. Engineering Report: (Comments 17 through 21 below)

17. Attachment G:

Prefinal approvals acquisition plan Section 1.0: First paragraph (Note: approval, but *permits* are not required.) The word permits was omitted.

Section 2.0: Paper will require erosion and sedimentation control provisions to be implemented prior to start of construction. Site development plans should include sedimentation for erosion control devices as required.

18. Attachment H:

Project Delivery Strategy, will have to be updated.

19. Attachment I:

a) **Wetlands Impact Reduction Plan. Page 6, 4.0:** Wetlands impact reduction measures last paragraph. Recommend five (5) feet of cover soils over buried components as a minimum for freezing protection.

b) **Page 7, Reference:** HDPE seep collars: concrete bulkheads may be a more suitable choice. Soil erosion and sediment control plan must be approved by the Pennsylvania Department of Environmental Resources (PA DER).

20. Attachment J:

Field Sampling Plan Section 1.3, page 1-2, 2nd paragraph. Reference: To (installation of an upgradient cut-off wall); as part of a partial remediation of the site from 1982 to 1983. The cut-off wall is not located on the Site drawings.

21. Attachment J, Page 2.2

Field measurement of temperature, pH, and conductivity has not been considered. These parameters are important for the successful operation of the treatment system; and as indicators of the dynamic physio-chemical characteristics of groundwater.

Pre-Final Design Submission
Volume VIII, Attachment M: O & M Plan (Comments 22a-f below)

22. a) Page 5.1, Paragraph 2

What is the upper limit of design extraction flow rate for the ISVS system in each component viz., landfill area, crest area, and toe area? What is limiting factor for extraction i.e., blower rating, conveyance system and connections, or extraction wells?

b) Page 5.1, Paragraph 3

What are the background levels of the landfill parameters i.e., temperature, opacity, carbon dioxide, percent LEL, and VOC? How do these background levels compare with the safe limit of operation of the ISVS system, with reference to the risk of landfill fire?

Is carbon monoxide a monitoring parameter in the landfill? (as mentioned on Page 4-3, Paragraph 2, Vol.

I, Engineering Report).

c) Page A-2-2, Paragraph 4

At a minimum, the Basic Health and Safety Training as per OSHA 1910.120(e) should be specified.

d) Page A-2-7, Paragraph 9

"exclude all sources of ignition from flammable areas", include no-smoking signs.

e) Page A-2-8, Paragraph 2

How will carbon dioxide be introduced inside the landfill?

f) Appendix A; Health and Safety /Contingency Plan:

Provide a map indicating the route to HAMOT Medical Center. In addition, Section 9 needs to contain written directions to HAMOT Medical Center

Prefinal Remedial Design Plans
Volume V Engineering Report Attachment D (Comments 23-43 below)

23. Drawing 6759-001

Legend: The Property Line and Approximate limit of the landfill are designated alike in the legend.

24. Drawing 6759-002

Location of Extraction Well EX-1 is not shown on the Site plan.

25. Drawing 6759-004

Toe area header pipe has been labeled as crest area header pipe; crest header piper is not labeled.

26. Drawing 6759-006 Landfill Area Detail

a) Flow sensor and gauge are incorrectly notated below treatment building.

b) The 4-inch diameter line immediately to the left of the condensation tank appears to slope away from tank at 1% slope. Need to provide slope direction.

27. Drawing 6759-007 Crest Area Detail

Need to specify timber sleeper support interval; it is assumed to be 7'0" O.C.

28. Drawing 6759-008

a) Regarding "Crest Area header pipe road crossing detail". Elbow labeled "45° elbow" is not a 45° elbow. It is approximately 30°.

b) Crest area header pipe road crossing detail. Suggestion that the PVC road crossing pipe should be installed through a corrugated metal or steel casing sleeve extending at a minimum of 4 feet beyond the edge of the service road in each direction.

29. Drawing 6759-009 ISVS Header Pipe Adjustable Support

a) Note Number 5: Does pipe need to be able to move axially? If so, suggest u-bolt be double-notted on each side of bottom bracket to prevent anchoring of pipe to support.

b) ISVS header pipe adjustable support Section A-A. Suggest the 6" x 6" treated timbers base be arranged in a cross section (+) or a (⊢⊣) design to offer additional lateral support.

30. Drawing 6759-009

Timber sleeper pipe support: suggest pinning of the wooden timber blocks with rebar to a depth that would not be detrimental to the underlying PVC membrane; to achieve additional later support.

31. Drawing 6759-010

Where are carbon monoxide and smoke sensors located?

32. Drawing 6759-012 Groundwater Recovery Well/Well Head Section

a) PVC discharge pipe from pump is prone to brittle failure due to forces imparted by pump, particularly with deeper wells and higher horsepower pumps. Should consider using steel pipe.

b) Pump manufacturers generally recommend placing submersible pumps a minimum of 5 feet off the bottom of the well versus 3 feet.

c) The underground steel-to PVC pipe connection (for the drain) may experience failure due to thrust and vertical loads from above-ground steel pipe. It is suggested that additional support to provided, possibly in the form of a thrust block.

33. Drawing 6759-013

An air stripper bypass system is part of the design. During the period of air-stripper by-pass, effluent will be directly pumped to the effluent tank, T-3. Does the design have features to pump back the stored wastewater across the air-stripper, once the air stripper is on-line? Or is this just for when the groundwater needs treatment for metals removal only.

34. Drawing 6759-014

a) Are anti-swirl baffles required in the equalization tank for mixing?

b) The designer should consider providing an overflow line with seal leg for the tanks to prevent rupture of the tanks due to overfilling should the high-high level interlock fail.

c) The high level switch on the air stripper should be below the inlet of the blower. Drawing 6759-016 appears to show the inlet below the 3'0" elevation indicated on the P&I Diagram.

d) Recommend a flowmeter on the influent line to the air stripper to allow balancing the system flow and to verify that minimum/maximum flows are not exceeded, adversely affecting air stripper performance.

e) Globe valves should be considered in lieu of bull valves on the discharge side of pumps to provide better throttling characteristics.

35. P&ID Drawing Number 6759-014

a) **General**

Label instruments and controls devices per ISA standards.

A "universal" system interlock that shuts off all motors and closes all automatic valves may be

appropriate. The system has some "local" interlocks that only affect one portion of the overall system (i.e., LAHH in T-3 shuts off P-5 & 6), while allowing the rest of the system to operate. It may be prudent to shut-down the entire system and correct problems that are causing the system to run outside of normal operating parameters.

b) T-1 System

Consider providing separate (redundant) unit for LSHH and make LAHH a universal interlock, and/or interlock condensate lines and from P-10 & 11 (it appears as if it is possible to direct backwash water to T-1 with these pump).

The function of KS is unclear, explain.

c) Filter System

There are no interlock functions shown for the system. What happens if the filter system malfunctions, clogs etc.?

d) Air Stripper

Consider Providing separate (redundant) LSHH unit and make LAHH a universal interlock.

Consider adding PDI across packing and make PDAH a universal interlock.

Consider adding a flow switch for air flow from the blower, and make a low flow condition a universal interlock.

e) T-3 System

Consider providing separate (redundant) LSHH unit and make LAHH a universal interlock. Is a PSE required for tank?

f) T-4 System

Consider providing separate (redundant) LSHH unit and make LSHH a universal interlock. Is a PSE required for tank?

g) **T-5 System**

Consider providing separate (redundant) LSHH unit and make LAHH a universal interlock. Is PSE required for tank?

h) **Well Systems**

Consider providing low temperature alarm and universal interlock for pipe sections with heat tracing.

36. **Drawing 6759-019**

Discharge Line Profile: maintain a minimum of 5 feet of earth cover over discharge lines to prevent freezing of standing water in the lines

37. **Drawing 6759-020**

Pipe collar detail: suggest consideration of concrete bulkheads in lieu of the HDPE pipe collars as indicated, with extension into the undisturbed sidewalls and trench invert at least 6 inches.

38. **Electrical Plan Drawing Sheet No. E-1**

Drawing does not show the level of detail referenced in Section 16400 of the Specifications (i.e., conduit runs, and number of conductors in conduit).

39. **Drawing A-2:**

Contains detail section symbols for 2/a-5 and 3/a-5: there is no Drawing A-5. Are the symbols on Drawing A-2 labeled incorrected? If so this needs to be corrected.

40. **Drawing A-3:**

Elevations: East side elevation; floor plans do not indicate a service door as shown.

41. **Drawing S-3:**

The detail 4/S-4 on the S.W. corner of the south wall on the S-3 foundation plan is not properly represented on DWG. S-4 with respect to the bar joist detail.

42. Drawing S-5:

Finish Floor elevations: need clarification. Spot finish floor elevations of El. 0.00" and El. 4.00" as shown do not correspond to concrete slab sections as indicated on DWG. S-6.

43. Drawing S-6:

a) Section detail 5/S-6: floor elevations do not correspond to floor slab plan as indicated DWG. S-5. Note 2.0 area adjacent to and surrounding floor drain is shown as EL. 0.50 on DWG. S-5.

b) Section detail 3/S-6: concrete slab slope does not correspond to floor plan as shown on Drawing S-5 at this section. Plan shows slope to exterior as well as interior.

Pre-Final Design Submission
Volume III, Attachment B: Groundwater Treatability Study Report:
(Comments 44-45 below)

The Pre-Final Design submission was the same as that submitted with the Preliminary Design submission. The comments previously raised were adequately addressed and/or incorporated except the following:

44. Previous Comment regarding whether ketones should be regulated.

So long as ketones are not regulated then the treatment system need not be designed to remove them.

45. Previous Comment No Addressed: Relating to Treatability Study (Section 4 Tables).

Discharge criteria were not added to Section 4 Tables. These criteria are presented elsewhere in the report, including Table 4-1. Restating these values in a column in each of the subsequent columns would provide ease of data interpretation, but is not necessary for the content and conclusions of the report.

Pre-Final Design Submission
Volume IV: Attachment C: Wetlands Assessment Report:

NOTE: Comments on this report will be shipped under separate cover during the week of February 21, 1994.